

Towards Further Cost Reductions and Acceleration in Utility Pole Removal

(Research period: FY2019–FY2021)

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(Keywords) utility pole removal, cost reduction, project acceleration

1. Introduction

The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) is promoting the removal of utility poles from the perspectives of improving disaster prevention, ensuring safety and comfort, and forming appealing landscapes. In May 2021, it decided on a new Plan to Promote Utility Pole Removal, pursuant to Article 7 of the Act on the Promotion of Utility Pole Removal.

This paper briefly describes research and study being conducted by NILIM with a view to thorough cost reductions and further acceleration of projects, among the initiative guidelines listed in the new Plan to Promote Utility Pole Removal.

2. Research and study aimed at cost reductions

The new Plan to Promote Utility Pole Removal provides that MLIT will work to reduce costs by about 20% on average by FY2025 and requires efforts to further reduce costs in addition to the adoption of low-cost methods that have been used to date.

Given this, NILIM has conducted a fact-finding survey of duct structures that have conventionally been widely used and smaller box (fig. 1), which are one low-cost method among common utility duct for power lines, with the objective of understanding the cost structure of common utility duct works with a view towards further cost reductions.

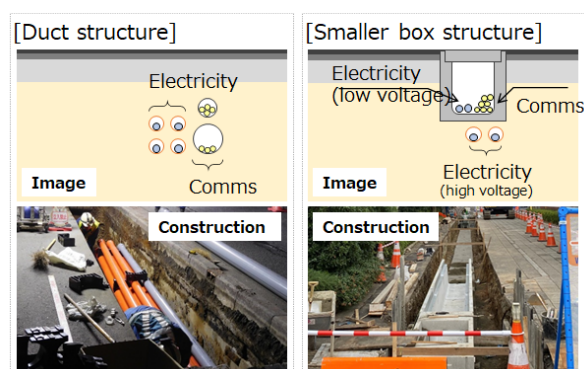


Fig. 1. Duct and smaller box common utility duct

The fact-finding survey analyzed the cost structure by capturing the construction conditions with video cameras, classifying and organizing the work time by workers, etc. for each job type, the operation time for each piece of construction machinery, and so on according to the fine distinctions in level 4 of the Works and Work Type Systematic Tree in the MLIT New Civil Engineering Works Quantity Surveying Outline, and then calculating the direct works costs using the unit prices in the quantity surveying materials for the same works (labor costs, machinery costs, materials costs, etc.).

This survey confirmed, albeit by comparisons of individual cases, that materials costs account for about the same proportion of works costs for the smaller box and for the conventional duct structure, and that this proportion is large (fig. 2). Based on the fact that economies of scale created by mass production, etc. have had little effect and materials costs remain high due to the small number of cases adopting the smaller box so far, and the fact that materials costs account for a large proportion of the works costs for the smaller box, further cost reductions may be achieved by lowering the costs of materials through

standardization and mass production.

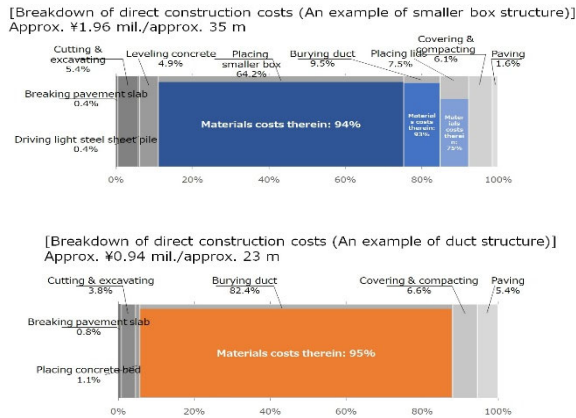


Fig. 2. Example of cost structure survey results

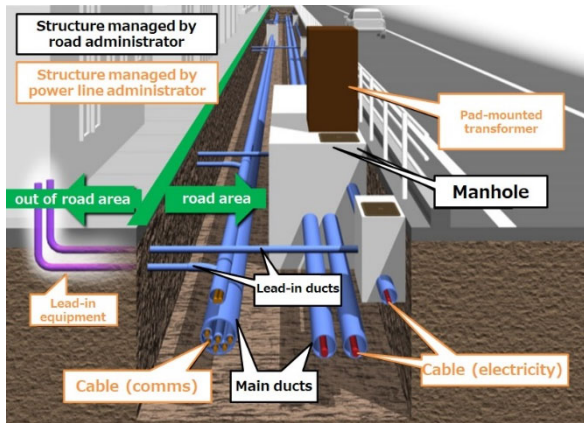


Fig. 3. Division of management in common utility duct (example of duct structure)

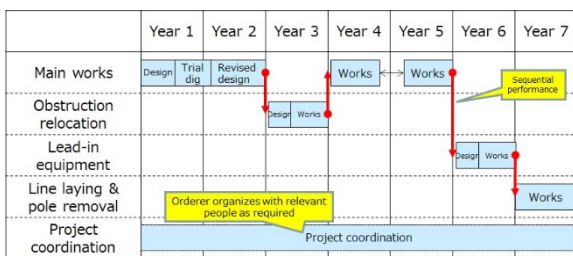


Fig. 4. Project period for common utility duct project

3. Research and study aimed at acceleration

The project period for common utility duct projects is supposed to average seven years at present, and the new Plan to Promote Utility Pole Removal is working to halve this period (to an average of four years).

As one approach aimed at reducing project periods, NILIM focused on the fact that construction in common utility duct (fig. 3) is performed separately by each administrator,

which means that each administrator performs its construction in series (fig. 4), and we considered the possibility of increasing the speed of the project overall if parallel construction were made possible by changing the division of these construction works.

To examine this, we firstly sent questionnaires of road administrators, power line administrators, and construction companies involved with common utility duct. The questionnaires investigate the benefits and challenges when building by “simultaneous construction,” where the same operator constructs the multiple structures currently constructed by the separate administrators, and by “continuous construction,” where different operators construct them continuously. As a result, while many answers indicated that coordinating schedules and arranging the division of responsibility in continuous construction were challenging, we received responses saying that the respondents can expect shorter construction periods and smoother works as benefits of continuous construction, and the project period may be reduced by changing the division of construction.

Furthermore, the construction fact-finding survey described in section 2 also investigated the breakdown of work time for each fine distinction to get an idea of the scope for reducing construction times, and the results confirmed the reality that cutting, excavating, covering, and compaction work took about half of the time (fig. 5). This led to the finding that permanent work zones (work zones continually established over a longer period than usual that are retained day and night) to reduce the number of times that cutting, excavating, covering, and compaction work is required may be effective in reducing the project period.

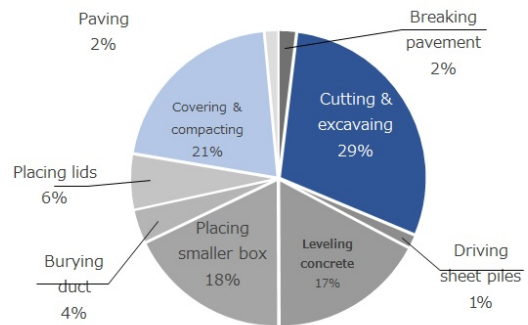


Fig. 5. Example of work time survey results

4. Towards further cost reductions and acceleration

The results of examinations to date have shown that increasing the projects that employ low-cost methods and moving forward with standardization of the products and materials that they use are effective in further reducing the costs of utility pole removal, and that changing the division of construction and promoting the use of permanent work zones are effective in further increasing speed.

Besides further consideration to reflect these initiatives in actual work sites, we intend to continue research and study aimed at additional cost reductions and acceleration from varied points of view, including consideration aimed at smoothing the formation of agreement.

☞ See here for detailed information

1) MLIT: Plan to Promote Utility Pole Removal
<https://www.mlit.go.jp/road/road/traffic/chicyuka/pdf/21-05.pdf>

2) Road Environment Division website
<http://www.nilim.go.jp/lab/dcg/kadai.html>